



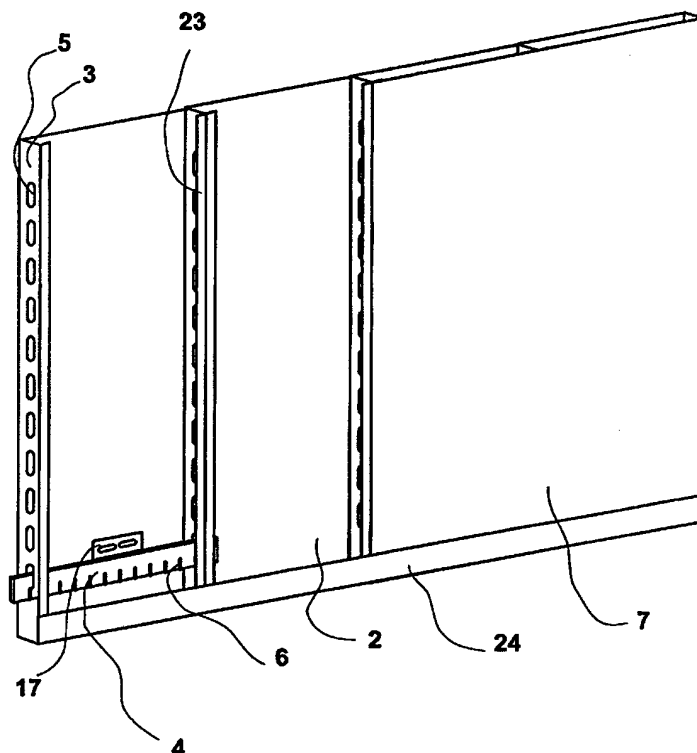
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>B66B 11/02</b>	<b>A1</b>	(11) International Publication Number: <b>WO 97/09265</b> (43) International Publication Date: 13 March 1997 (13.03.97)
<p>(21) International Application Number: PCT/FI96/00478</p> <p>(22) International Filing Date: 6 September 1996 (06.09.96)</p> <p>(30) Priority Data:  954196 7 September 1995 (07.09.95) FI  956200 21 December 1995 (21.12.95) FI</p> <p>(71) Applicant (for all designated States except US): KONE OY [FI/FI]; Munkkiniemen puistotie 25, FIN-00330 Helsinki (FI).</p> <p>(72) Inventors; and  (75) Inventors/Applicants (for US only): ROPONEN, Ismo [FI/FI]; Valkamanpolku 4 C 7, FIN-05840 Hyvinkää (FI). PAHKALA, Kari [FI/FI]; Honkakuja 3, FIN-12400 Tervakoski (FI). HATAKKA, Rauno [FI/FI]; Kaartotie 1 C 12, FIN-12400 Tervakoski (FI). JUNTUNEN, Asko [FI/FI]; Satulatie 21, FIN-90540 Oulu (FI).</p> <p>(74) Agent: KONE OY; Patent Dept., P.O. Box 677, FIN-05801 Hyvinkää (FI).</p>	<p>(81) Designated States: AL, AU, BB, BG, BR, CA, CN, CZ, EE, GE, HU, IL, IS, JP, KP, KR, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b>  <i>With international search report.  In English translation (filed in Finnish).</i></p>	

(54) Title: SYSTEM FOR THE MOUNTING OF DECORATIVE PARTS, AND A SET OF MOUNTING ELEMENTS

## (57) Abstract

Projecting parts (3) at both edges of the raw panels (2) are provided with holes (5) placed at the same height and mounting combs (4) are fastened to the projecting parts (3) by means of their teeth (6), whereupon the decorative panels (7) are mounted on the mounting combs (4) using mounting elements. The wall panel (7) of the elevator car rests on the top of a skirting (24). The skirting is provided with ventilation holes below the decorative panels (7). Different decorative elements can be attached to the skirting (24).



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SYSTEM FOR THE MOUNTING OF DECORATIVE PARTS, AND A SET OF MOUNTING ELEMENTS

5 The present invention relates to a system for mounting decorative parts on raw panels, as defined in the preamble of claim 1, and to a set of mounting elements for the mounting of decorative elements, as defined in claim 10. In particular, the invention relates to the mounting of wall panels and skirting boards.

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The interior decoration of an elevator car is composed of wall and ceiling panels and floor surfacing. The corners between the walls are often provided with corner pieces to cover the edges of the wall panels. Part of the wall surfaces may also be covered by display or push-button panels. The wall panels abut against the ceiling either directly or via a cornice strip. A skirting board is provided at the junction of the floor surfacing and the wall panel.

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The decorative materials for an elevator car are generally selected last, so that they will accord with the decorative colours of the building. The decoration is usually renewed at least once during the lifetime of the elevator if the decorative colours of the building are changed or the decorative materials are worn out.

30 In the conventional wall solution, decorative materials are fixed to raw panel walls either by gluing or using screws. In the case of a cornered wall, the mounting methods are dependent on the pitch of the raw panels. The width of raw panels varies from 200 mm to 400 mm. A panel in an edge position may be a non-standard one, depending on the size of the elevator car.

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The raw panels are bent at their edges and fixed to each other inside the elevator car by means of screws or using spot welding. Screws may be a hindrance when the

decorative panels are being mounted. In most cases, decorative panels are only fixed by their edges, which may result in bulging in the middle portion. Decorative panels are also often fixed by gluing, in which case it  
5 is difficult or impossible to replace them afterwards.

The object of the present invention is to eliminate the drawbacks referred to above. The system of the invention for the mounting of decorative panels is characterized  
10 by what is presented in the characterization part of claim 1. Other embodiments and the mounting elements of the invention are characterized by what is presented in the other claims.

15 The solution of the invention provides the following advantages:

- the mounting system only requires a space of 1 mm
- more space is left over for decoration
- 20 - easy installation on site
- low costs
- installation takes place inside the car
- decorative panels can be replaced in half a day
- more freedom in the choice of the size of decorative  
25 panels
- easy replacement of decorative panels
- gives the decorator full freedom with respect to decoration
- decoration can be chosen at the latest possible stage
- 30 - due to a skirting system, the decorative panels impose no strain on the panel holders
- the skirting board can be provided with a surfacing after installation of the floor, and the skirting board surfacing can be easily replaced if this is necessary due to wear or a new decorative design  
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- ample choice regarding the skirting board surfacing
- vent holes are not blocked by dirt and litter, nor do they interfere with the visual implementation.

In the following, the invention is described in more detail by the aid of a few examples of its embodiments by referring to the attached drawings, in which

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- Fig. 1 presents raw panels of an elevator car, mounting combs attached to them and a mounted decorative panel,
- Fig. 2a and 2b illustrate the structure of the mounting combs,
- Fig. 3a and 3b present a spring plate as used in the mounting of decorative panels
- Fig. 4 presents a mounting band used for mounting the decorative panels
- Fig. 5a and 5b present mounting plates used for mounting the decorative panels
- Fig. 6 presents a skirting board and the parts used to fix it, and
- Fig. 7a, 7b and 7c present different skirting solutions.

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Fig. 1 shows a wall of an elevator car, consisting of raw panels 2 with vertical parts 3 projecting towards the interior of the elevator car, formed by bending the edges of the raw panels 2 so that they form an edge 23. The edge 23 has an extremity turned parallel to the raw panel 2. Fig. 1 is a skeleton diagram, so it does not fully correspond to the real situation. The raw panels 2 are attached to each other by spot welding, with screws or by braiding. The projecting parts 3 are provided with holes 5 at suitable distances, placed at the same height on both edges of the panel. In these holes 5 in the edges 3 of the raw panels 2, mounting combs 4 are placed in a horizontal position so that they engage the panel edges with their teeth 6 according to the width of the raw panels 2. The mounting combs 4 are not designed to carry the load of heavy decorative panels, but the force resulting from the load is transmitted to a skirting

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board 24 and further to the floor structures. In the case of light decorative panels, the mounting combs 4 may carry their weight. The width of the teeth 6 of the mounting combs 4 is 50 mm or 10 mm, depending on the width of the raw panels 2. The interval 22 between each two adjacent teeth is 6 is always the same width. The mounting combs 4 are attached sufficiently tightly on the edgemost raw panels 2 having only one edge 3. The decorative panels 7 are mounted on these mounting combs 4 using various fixing elements. The decorative panels 7 used may be made of stone, aluminium + stone, steel plate + plywood or plywood + laminate.

Fig. 2a and 2b illustrate the structure of the mounting combs 4. The mounting combs are made of iron plate or spring plate. Fig. 2a shows a mounting comb 4 with wide teeth 6 and a stud 8 at the left-hand end of the comb and a slot 9 at the right-hand end. When the mounting combs are placed end to end, the stud 8 at the end of the mounting comb 4 will go into the slot 9 in the next comb 4. In this way, the mounting combs 4 are held at the same height and engage each other by means of the stud 8 and the slot 9. Fig. 2b shows a mounting comb 4 with narrower teeth 6. The length of the mounting combs 4 may vary between 360 mm up to 860 mm.

Fig. 3a presents a rectangular spring plate 10 used to fix the decorative panel 7 to the mounting combs 4. Fig. 3b presents the spring plate 10 in side view, showing its hook-like structure. The material of the spring plate 10 is hard spring steel. The spring plate 10 has two elongated horizontal holes, the one on the left being indicated by number 11 and the one on the right by number 12. The spring plate 10 is attached to the decorative panels using screws 7, which are fastened in these holes 11 and 12. To ensure a more secure attachment, some glue is applied below the holes. The spring plates 10 are then fastened to the mounting combs 4 by

making use of their hook-like structure. The spring plates 10 measure 70 x 100 mm and have angles of 60 degrees. Angles A and B on the spring plates 10 are 60 degrees (Fig. 3b).

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Fig. 4 presents a mounting band 13 of a rectangular shape, provided with horizontal elongated mounting holes 14. The holes have been left unmachined, so they form spikes 15, by means of which the mounting band 13 is attached to the decorative panel 7 by pressing. The mounting band 13 has three elongated holes 16 enabling the band to be broken along the line of these holes. The mounting band 13 also comprises hooks 19 with a reduced-strength area 18 formed by four round holes along the left edge of the hook to allow the hook to be bent out. Along the other edges, the hooks have been cut clear of the band. The structure and size of the hooks 19 may vary as required in each situation. By means of the hooks 19, the decorative panel 7 can be mounted on the mounting combs 4, and the hooks 19 can be bent to a position perpendicular to the mounting band 13. As many of the hooks as is necessary for the attachment are bent this way. The mounting band can also be fixed to the decorative panel by the aid of the spikes and screws or only by gluing, in which case the hole part 14 of the spikes is left unmachined.

Fig. 5a presents a mounting plate 20 made of a thin steel plate about 1.2 mm thick. The mounting plate 20 is used with stone, glass or mirror panels as well as stainless and similar decorative panels 7. The mounting plate 20 is made of thin sheet steel with hooks 19 cut in it. The pitch of the hooks is 150 mm because the mounting combs 4 also have a 150-mm pitch. The hooks are similar to the hooks 19 on the mounting band 13. Along the left edge there are four round holes 18 forming an area of reduced strength. The hook can be bent along the line of the holes 18. This edge keeps the hook connected

to the mounting plate 20. The part to the right of the holes forms the hook itself 19. Its design may vary depending on the situation. It may be either narrower or wider. The decorative panel 7 is supported on the mounting combs 4 by the hooks 19. When the decorative panel 7 is being glued to the mounting plate 20, the hooks 19 are protected with a piece of tape to prevent them from being glued to the panels 7.

Fig. 6 presents the lower part of a raw car wall. The raw car walls are made of wall plates 32 welded together by their edges 34, which have been bent into an angle perpendicular to the wall surface, the extreme edges of the plates being further bent in the direction of the wall surface so that two adjacent plates form a flange 23. The perpendicular edges 34 are provided with holes 36 cut in the lower part of the raw car wall, permitting the mounting combs 38 of the skirting to be mounted in these holes. The mounting combs are passed through the holes 36 and pressed down in position so that the edge 34 of the wall plates goes into the mounting slot between the teeth of the mounting comb. The mounting comb 38 is made of sheet steel with mounting slots 40 and elongated cut-outs 42 punched in it. These cut-outs are utilized in the mounting of the skirting and they also serve as ventilation holes. The function of the mounting combs is to attach the skirting boards to the wall surface, i.e. to hold the skirting boards against the flange 23. The positions of the holes 36 in the raw car walls and the positions of the mounting slots 40 in the mounting combs are so determined that the weight of the skirting 24 mounted on the mounting comb and of the wall panel placed on top of it is not carried by the raw car wall structure.

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Fitted in the cut-out 42 in the mounting comb 38 is a dog nut 44, which is retained in the cut-out by means of spring clips. During installation, the correct positions



of the dog nuts are measured by the aid of the mounting holes in the skirting and the dog nuts are fitted in the cut-outs before the skirting is mounted. In addition to the holes 46 for the mounting screws, the skirting is provided with ventilation holes 48 punched in the upper part of the skirting. The ventilation holes 48 in the skirting and the cut-outs 42 in the mounting comb are so positioned that they are in alignment with each other, thus forming a ventilation channel in the elevator car.

The holes are at a distance from the floor surfacing of the elevator car, so they are not exposed to litter or liable to being blocked. Attached to the lower part of the skirting is a profiled decorative fillet 52, which is retained by the same screws 50 as the skirting. The profiled decorative fillet 52 is placed substantially immediately against the floor surfacing and it is low enough not to cover the ventilation holes. The fillet can also be fastened using stickers, tape or glue. Alternatively, the skirting can also be left without a decorative fillet, as illustrated by Fig. 7a and 7c.

Fig. 7a, 7b, 7c present sectional views of a part of the wall structure, floor surfacing and skirting in different skirting solutions according to the invention. The skirting 24 is attached with a screw 50 and nut 44 to the mounting comb 38. The mounting comb 38 is fitted in a slot in the edge 34 of the wall plate, leaving the flanges 23 formed from the extremities of the wall plate edges between the mounting comb and the skirting. The upper part of the skirting forms a horizontal supporting surface 54. This has been accomplished e.g. by bending the upper edge of the skirting to an angle of 90°. The lower edge of the skirting rests on the floor 56 of the raw car, extending below the floor surfacing 58 of the car. The floor surfacing 58 consists of e.g. plastic mat glued on the raw car floor. The decorative panel of the elevator car is attached to the raw car wall and it is

supported by its lower edge 60 on the supporting surface 54 of the skirting.

- The skirting in Fig. 7a is not provided with a profiled decorative fillet, whereas Fig. 7b shows a decorative fillet 62 attached to an L-shaped skirting, the fillet being placed directly on the floor surfacing. In Fig. 7c, the edges of the floor surfacing 59 are of a curved shape. Fitted onto the curved edge is an L-shaped capping strip, one leg 64 of which covers the edge of the floor surfacing while the other leg 66 covers part of the skirting. Leg 66 is provided with ventilation holes corresponding to those in the skirting.
- 15 It is obvious to a person skilled in the art that the invention is not restricted to the examples described above, but that the embodiments of the invention be varied in the scope of the claims presented below.

## CLAIMS

1. System for the mounting of the decorative parts (7,24) of an elevator car on raw panels (2) having vertical parts (3) projecting towards the interior of the elevator car, **characterized** in that
  - mounting combs (4) can be fitted in the projecting parts of the raw panels (2) and that the decorative parts (7,24) can be attached to the mounting combs (4).
2. System as defined in claim 1, **characterized** in that a hook-like spring plate (10) is used for the mounting of decorative panels (7).
3. System as defined in claim 1, **characterized** in that the upper edge of the skirting (24) is provided with ventilation holes (48) fitted at a distance from the floor surface.
4. System as defined in claim 1, **characterized** in that the decorative panels (7) are attached to the mounting combs (4) by means of hooks comprised in the mounting elements (13,20).
5. System as defined in claim 1, **characterized** in that the upper edge of the skirting (24) is provided with ventilation holes (48) fitted at a distance from the floor surface.
6. System as defined in claim 1, **characterized** in that the skirting (24) extends to the floor of the raw car and that the floor surfacing (58) of the elevator car on the floor of the raw car abuts against the skirting (24).
7. System as defined in claim 1, **characterized** in that the floor surfacing (58) is higher in the portion in the

immediate vicinity of the skirting than in the rest of the floor area and extends above the middle of the skirting (24) in the vertical direction of the skirting (24).

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8. System as defined in any one claims 1-6, **characterized** in that it comprises a face plate attached to the skirting (24), said face plate abutting against the floor surfacing (58) of the elevator car.

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9. System as defined in any one of claims 1-8, **characterized** in that the face plate is replaceable.

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10. Set of mounting elements for the mounting of decorative panels (7) in an elevator car, said mounting elements comprising raw panels (2) which have vertical parts (3) projecting towards the interior of the elevator car, **characterized** in that the vertical parts (3) are provided with holes (5) placed at the same height; mounting combs (4) which can be fitted in the holes (5) and fastened to the projecting parts (3) by means of their teeth (6); and mounting elements which are attached to the decorative panels (7) and can be fitted to the mounting combs (4).

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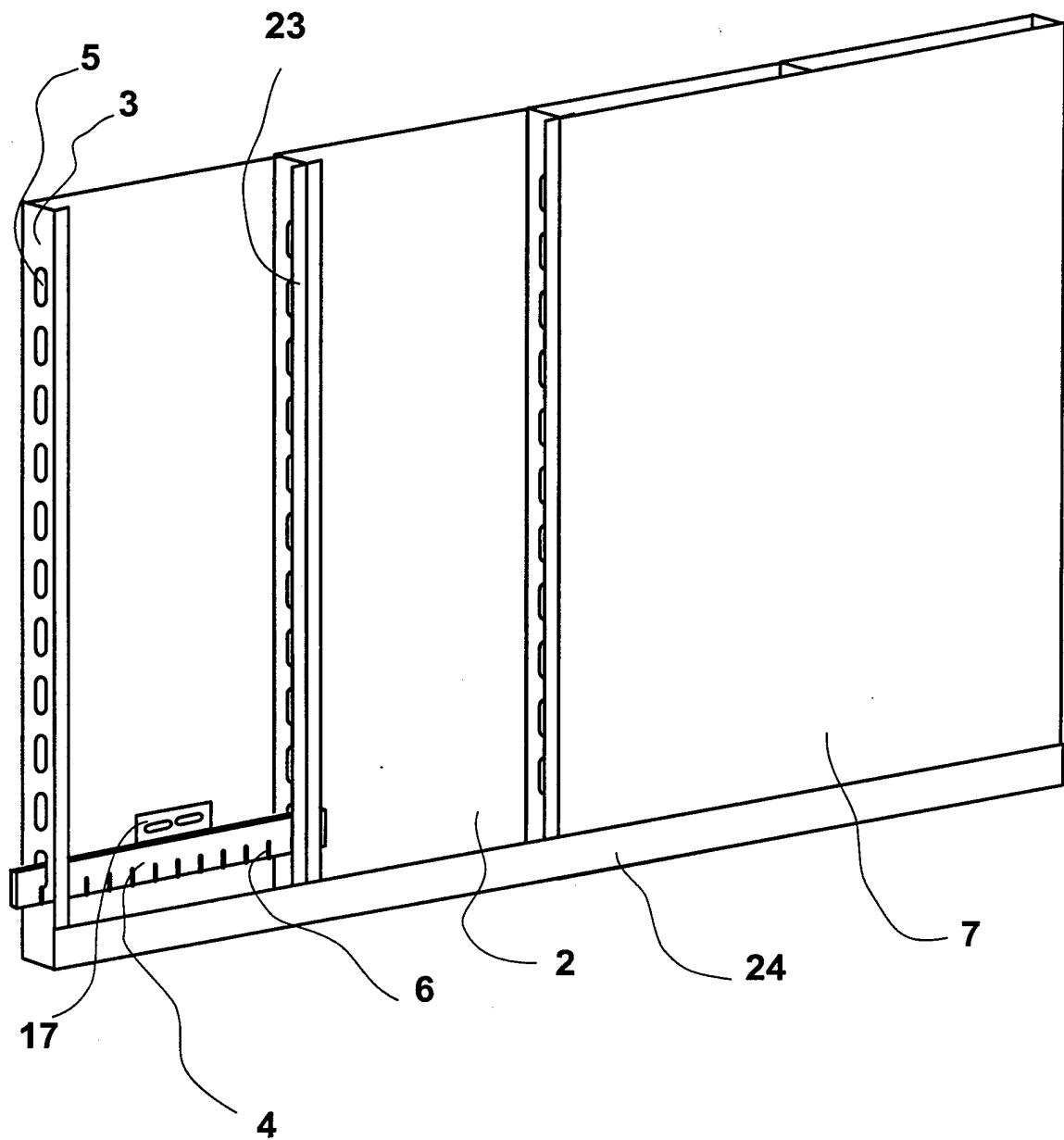
11. Set of mounting elements as defined in claim 10 for the mounting of decorative panels (7) in an elevator car, **characterized** in that the mounting combs (4) are joined together by their ends via an arrangement where a stud (8) provided at the end of one mounting comb (4) goes into a slot (9) provided at the end of another mounting comb (4), and that the mounting combs (4) are fitted at appropriate heights as required by the decorative panels (7).

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12. Set of mounting elements as defined in claim 11 for the mounting of decorative panels (7) in an elevator car, **characterized** in that the size of the mounting

combs (4) and the width of the teeth (6) are adapted depending on the width of the raw panels (2).

13. Set of mounting elements as defined in claim 12 for  
5 the mounting of decorative panels (7) in an elevator  
car, **characterized** in that the gaps between the teeth of  
the mounting combs (4) are of the same width.

**Fig. 1**

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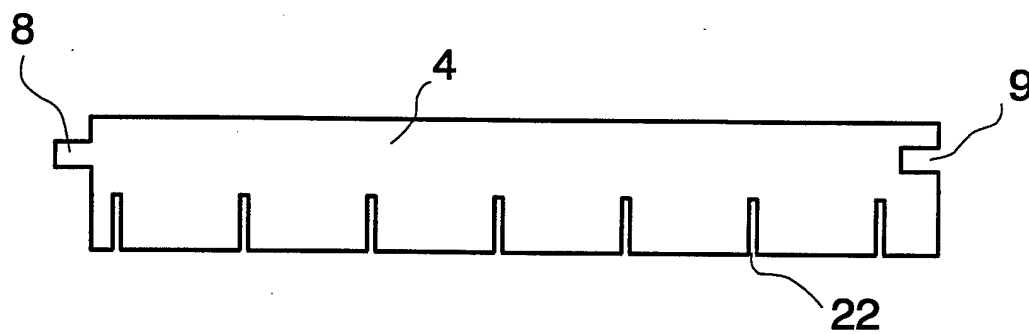


Fig. 2a

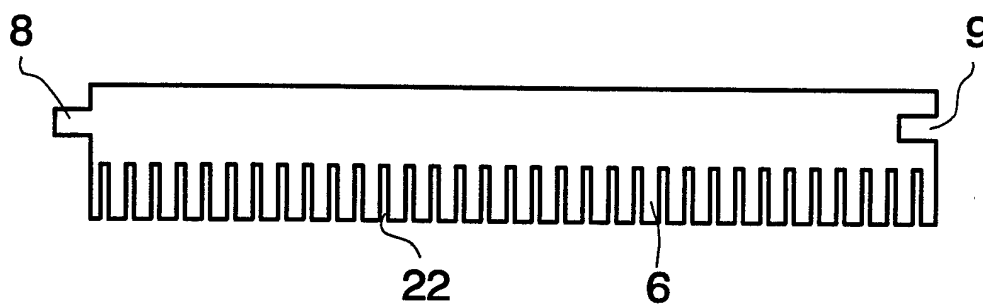


Fig. 2b

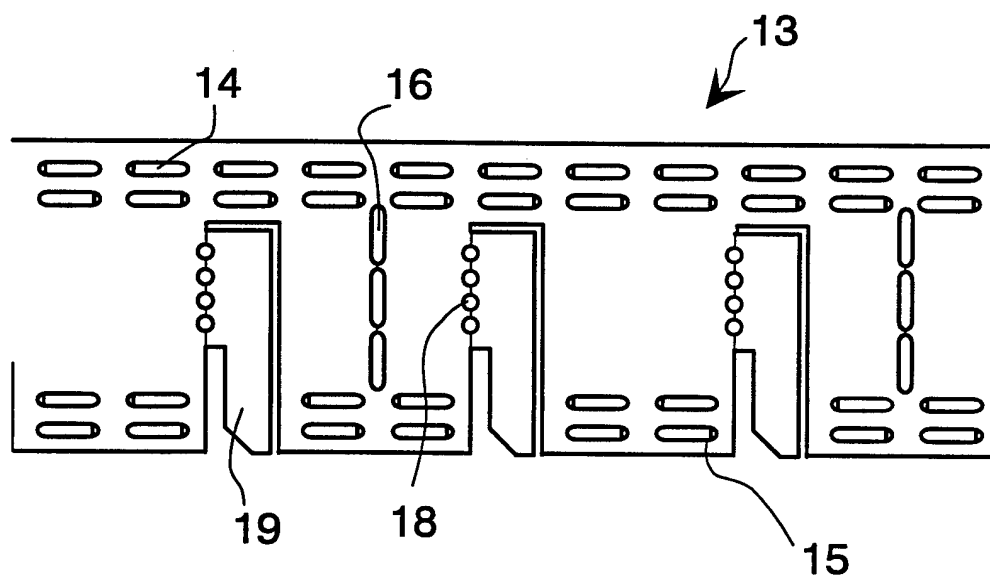


Fig. 4

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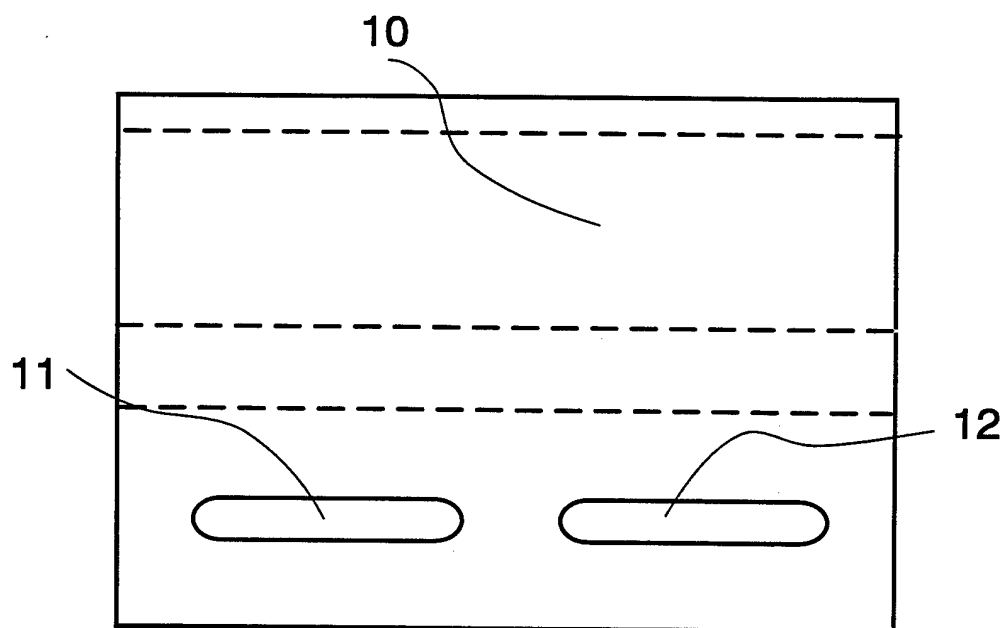


Fig. 3a

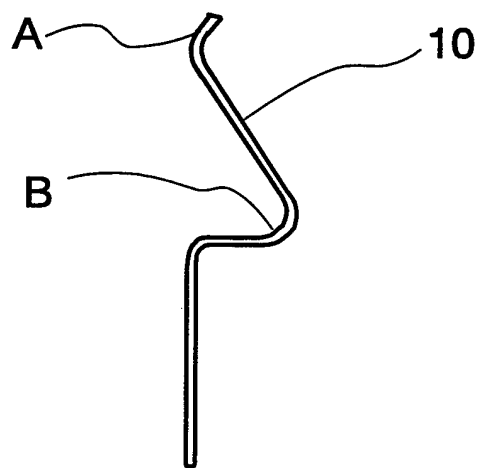


Fig. 3b



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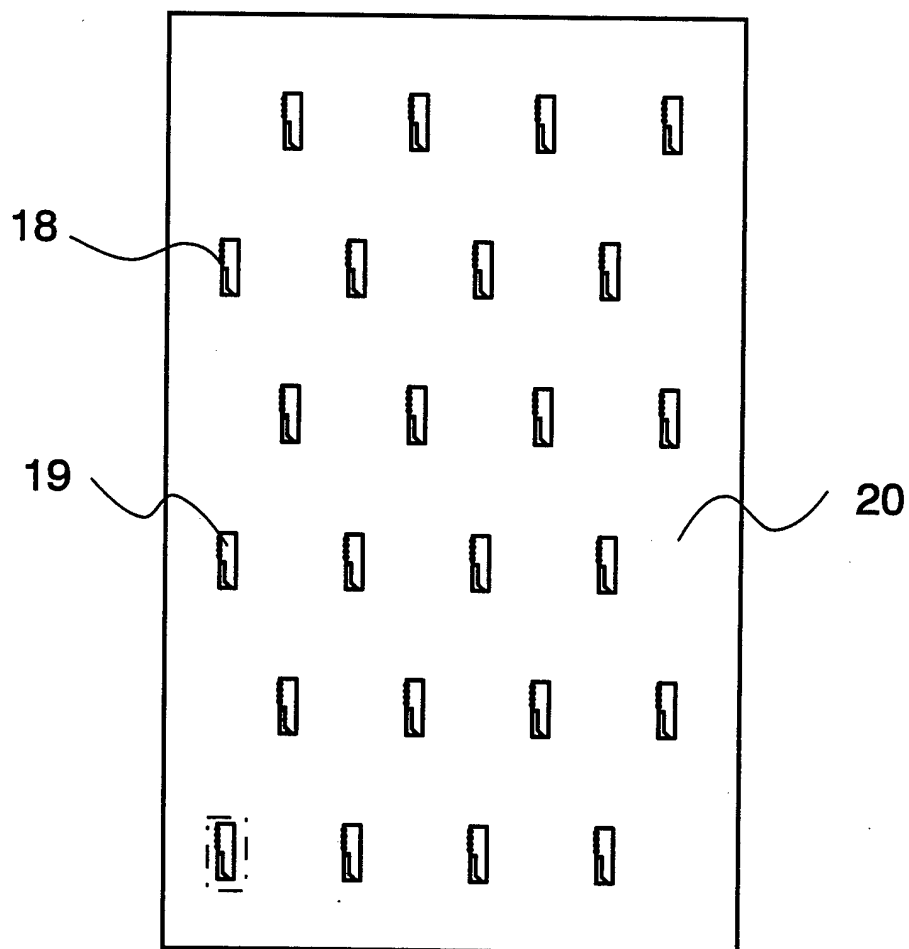


Fig. 5a

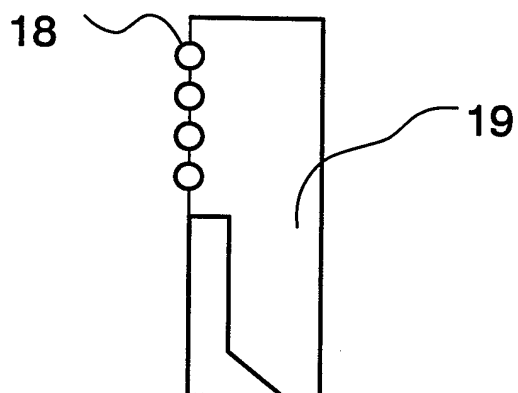


Fig. 5b

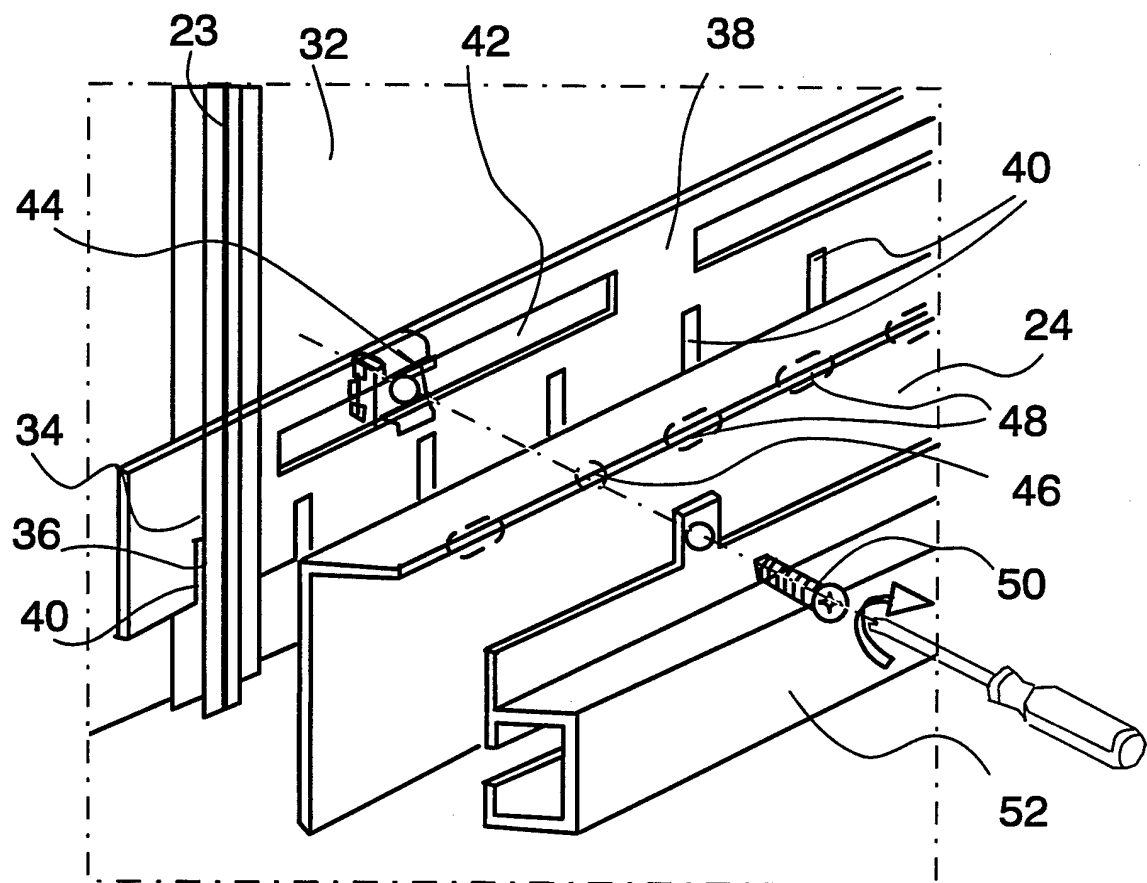


Fig. 6

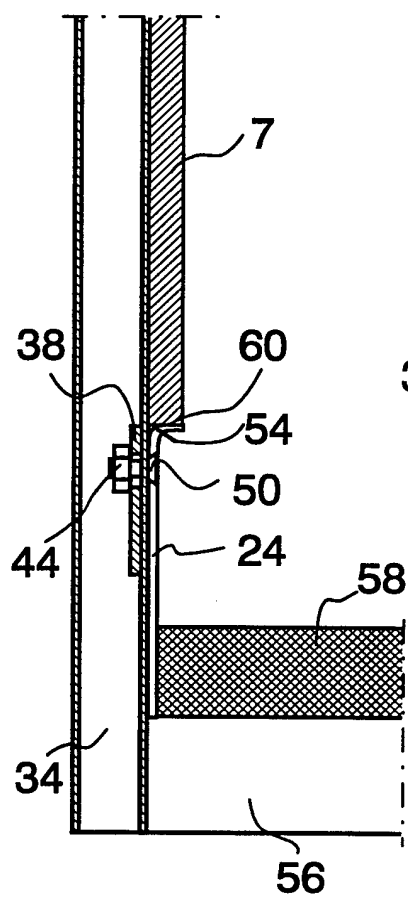


Fig. 7a

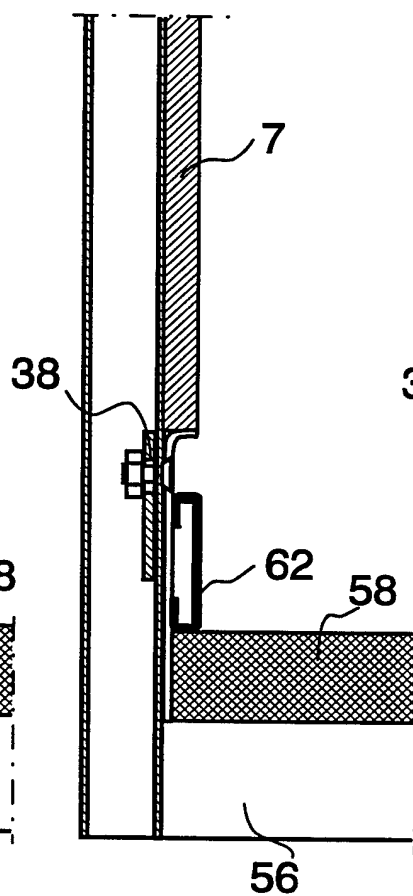


Fig. 7b

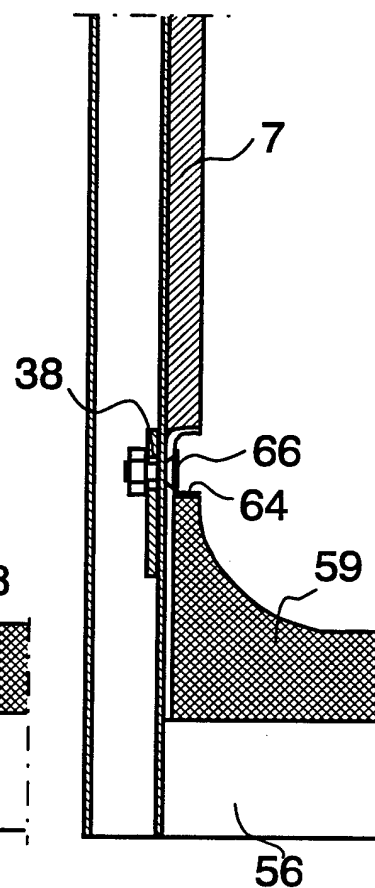


Fig. 7c

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 96/00478

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B66B 11/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B66B, E04B, E04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	FR 1396764 A (OTIS ELEVATOR COMPANY), 15 March 1965 (15.03.65), figure 3, details 11,13, 15,19 --	1-13
Y	US 5060434 A (R.J. ALLISON), 29 October 1991 (29.10.91) --	1-13
Y	SE 9200536 A (EUROPROFIL AB), 22 August 1993 (22.08.93) --	1-13
A	US 3631942 A (MORRISON, J.B.), 4 January 1972 (04.01.72) --	

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International application No.

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 0585945 A1 (KONE ELEVATOR GMBH), 9 March 1994 (09.03.94), figures 1-2  --	
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

28/10/96

International application No.

PCT/FI 96/00478

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